

2010_11_15_Sequence_Listing

SEQUENCE LISTING

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<110> STATENS SERUM INSTITUT
      ANDERSEN, Peter
      SKJOT, Rikke Louise Vinther

<120> TUBERCULOSIS VACCINE AND DIAGNOSTICS BASED ON THE MYCOBACTERIUM
      TUBERCULOSIS SAT-6 GENE FAMILY

<130> 0459-0752P

<140> US 10/723,908
<141> 2003-11-26

<160> 59

<170> PatentIn 2.0

<210> 1
<211> 100
<212> PRT
<213> M. tuberculosis

<400> 1
Met Ala Glu Met Lys Thr Asp Ala Ala Thr Leu Ala Gln Glu Ala Gly
1      5      10      15
Asn Phe Glu Arg Ile Ser Gly Asp Leu Lys Thr Gln Ile Asp Gln Val
20     25     30
Glu Ser Thr Ala Gly Ser Leu Gln Gly Gln Trp Arg Gly Ala Ala Gly
35     40     45
Thr Ala Ala Gln Ala Ala Val Val Arg Phe Gln Glu Ala Ala Asn Lys
50     55     60
Gln Lys Gln Glu Leu Asp Glu Ile Ser Thr Asn Ile Arg Gln Ala Gly
65     70     75
Val Gln Tyr Ser Arg Ala Asp Glu Glu Gln Gln Ala Leu Ser Ser
85     90     95
Gln Met Gly Phe
100

<210> 2
<211> 95
<212> PRT
<213> M. tuberculosis

<400> 2
Met Thr Glu Gln Gln Trp Asn Phe Ala Gly Ile Glu Ala Ala Ala Ser
1      5      10      15
Ala Ile Gln Gly Asn Val Thr Ser Ile His Ser Leu Leu Asp Glu Gly
20     25     30
Lys Gln Ser Leu Thr Lys Leu Ala Ala Trp Gly Gly Ser Gly Ser
35     40     45
Glu Ala Tyr Gln Gly Val Gln Gln Lys Trp Asp Ala Thr Ala Thr Glu
50     55     60
Leu Asn Asn Ala Leu Gln Asn Leu Ala Arg Thr Ile Ser Glu Ala Gly
65     70     75
Gln Ala Met Ala Ser Thr Glu Gly Asn Val Thr Gly Met Phe Ala
85     90     95

<210> 3
<211> 96
<212> PRT
<213> M. tuberculosis

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2010_11_15_Sequence_Listing

<400> 3

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Met Ser Gln Ile Met Tyr Asn Tyr Pro Ala Met Leu Gly His Ala Gly
1      5      10      15
Asp Met Ala Gly Tyr Ala Gly Thr Leu Gln Ser Leu Gly Ala Glu Ile
20      25      30
Ala Val Glu Gln Ala Ala Leu Gln Ser Ala Trp Gln Gly Asp Thr Gly
35      40      45
Ile Thr Tyr Gln Ala Trp Gln Ala Gln Trp Asn Gln Ala Met Glu Asp
50      55      60
Leu Val Arg Ala Tyr His Ala Met Ser Ser Thr His Glu Ala Asn Thr
65      70      75      80
Met Ala Met Met Ala Arg Asp Thr Ala Glu Ala Lys Trp Gly Gly
85      90      95
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<210> 4

<211> 294

<212> DNA

<213> M. tuberculosis

<220>

<221> CDS

<222> (1)...(294)

<400> 4

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atg agc ctt ttg gat gct cat atc cca cag ttg gtg gcc tcc cag tcg      48
Met Ser Leu Leu Asp 5 Ala His Ile Pro Gln Leu Val Ala Ser Gln Ser
1      5      10      15

gcg ttt gcc gcc aag gcg ggg ctg atg cgg cac acg atc ggt cag gcc      96
Ala Phe Ala Ala Lys 20 Ala Gly Leu Met 25 Arg His Thr Ile 30 Gln Ala

gag cag gcg gcg atg tcg gct cag gcg ttt cac cag ggg gag tcg tcg      144
Glu Gln Ala 35 Ala Met Ser Ala 40 Ala Phe His Gln Gly 45 Glu Ser Ser

gcg gcg ttt cag gcc gcc cat gcc cgg ttt gtg gcg gcg gcc gcc aaa      192
Ala Ala Phe Gln Ala Ala His 55 Ala Arg Phe Val 60 Ala Ala Ala Lys
50      55      60

gtc aac acc ttg ttg gat gtc gcg cag gcg aat ctg ggt gag gcc gcc      240
Val Asn Thr Leu Leu Asp 70 Val Ala Gln Ala Asn 75 Leu Gly Glu Ala 80 Ala
65      70      75      80

ggt acc tat gtg gcc gcc gat gct gcg gcc gcg tcg acc tat acc ggg      288
Gly Thr Tyr Val 85 Ala Ala Asp Ala Ala 90 Ala Ser Thr Tyr Thr 95 Gly
85      90      95

ttc tga      294
Phe
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<210> 5

<211> 97

<212> PRT

<213> M. tuberculosis

<400> 5

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Met Ser Leu Leu Asp Ala His Ile Pro Gln Leu Val Ala Ser Gln Ser
1      5      10      15
Ala Phe Ala Ala Lys Ala Gly Leu Met Arg His Thr Ile Gly Gln Ala
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```

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20
 Glu Gln Ala Ala Met Ser Ala Gln Ala Phe His Gln Gly Glu Ser Ser
 35
 Ala Ala Phe Gln Ala Ala His Ala Arg Phe Val Ala Ala Ala Lys
 50
 Val Asn Thr Leu Leu Asp Val Ala Gln Ala Asn Leu Gly Glu Ala Ala
 65
 Gly Thr Tyr Val Ala Asp Ala Ala Ala Ser Thr Tyr Thr Gly
 85
 Phe

<210> 6
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 <212> DNA
 <213> M. tuberculosis

<220>
 <221> CDS
 <222> (1)...(339)

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 Leu Ile Pro Gly Arg Met Val Leu Asn Trp Glu Asp Gly Leu Asn Ala
 1 5 10 15
 ctt gtt gcg gaa ggg att gag gcc atc gtg ttt cgt act tta ggc gat 96
 Leu Val Ala Glu Gly Ile Glu Ala Ile Val Phe Arg Thr Leu Gly Asp
 20 25 30
 cag tgc tgg ttg tgg gag tcg ctg ctg ccc gac gag gtg cgc cga ctg 144
 Gln Cys Trp Leu Trp Glu Ser Leu Leu Pro Asp Glu Val Arg Arg Leu
 35 40 45
 ccc gag gaa ctg gcc cgg gtg gac gca ttg ttg gac gat ccg gcg ttc 192
 Pro Glu Glu Leu Ala Arg Val Asp Ala Leu Leu Asp Asp Pro Ala Phe
 50 55 60
 ttc gcc ccg ttc gtg ccg ttc ttc gac ccg cgc agg ggc cgg ccg tcg 240
 Phe Ala Pro Phe Val Pro Phe Phe Asp Pro Arg Arg Gly Arg Pro Ser
 65 70 75 80
 acg ccg atg gag gtc tat ctg cag ttg atg ttt gtg aag ttc cgc tac 288
 Thr Pro Met Glu Tyr Tyr Leu Gln Leu Met Phe Val Lys Phe Arg Tyr
 85 90 95
 cgg ctg ggc tat gag tcg ctg tgc cgg gag gtg gct gat tcg atc acc 336
 Arg Leu Gly Tyr Glu Ser Leu Cys Arg Glu Val Ala Asp Ser Ile Thr
 100 105 110
 tga 339

<210> 7
 <211> 112
 <212> PRT
 <213> M. tuberculosis

<400> 7
 Met Ile Pro Gly Arg Met Val Leu Asn Trp Glu Asp Gly Leu Asn Ala
 1 5 10 15
 Leu Val Ala Glu Gly Ile Glu Ala Ile Val Phe Arg Thr Leu Gly Asp
 20 25 30
 Gln Cys Trp Leu Trp Glu Ser Leu Leu Pro Asp Glu Val Arg Arg Leu
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35
 Pro Glu Leu Ala Arg Val Asp Ala Leu Leu Asp Asp Pro Ala Phe
 50
 Phe Ala Pro Phe Val Pro Phe Phe Asp Pro Arg Gly Arg Pro Ser
 65
 Thr Pro Met Glu Val Tyr Leu Gln Leu Met Phe Val Lys Phe Arg Tyr
 85
 Arg Leu Gly Tyr Glu Ser Leu Cys Arg Glu Val Ala Asp Ser Ile Thr
 100
 105
 110

<210> 8
 <211> 285
 <212> DNA
 <213> M. tuberculosis

<220>
 <221> CDS
 <222> (1)...(285)

<400> 8
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 Met Thr Ile Asn Tyr 5 Gln Phe Gly Asp Val 10 Asp Ala His Gly Ala Met
 1
 atc cgc gct cag gcc ggg tgc ctg gag gcc gag cat cag gcc atc att 96
 Ile Arg Ala Gln Ala Gly Ser Leu Glu Ala Glu His Gln Ala Ile Ile
 20
 25
 30
 tct gat gtg ttg acc cgc agt gac ttt tgg ggc ggc gcc ggt tgc gcg 144
 Ser Asp Val 35 Leu Thr Ala Ser Asp Phe Trp Gly Gly Ala 45 Gly Ser Ala
 40
 50
 gcc tgc cag ggg ttc att acc cag ctg gcc cgt aac ggc cag gtg atc 192
 Ala Cys Gln Gly Phe Ile Thr 55 Gln Leu Gly Arg Asn Phe Gln Val Ile
 60
 70
 75
 80
 tac gag cag gcc aac gcc cac ggg cag aag gtg cag gct gcc ggc aac 240
 Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val 75 Gln Ala Ala Gly Asn
 65
 70
 85
 aac atg gca caa acc gac agc gcc gtc ggc tcc agc tgg gcc taa 285
 Asn Met Ala Gln Thr 85 Asp Ser Ala Val 90 Gly Ser Ser Trp Ala
 90

<210> 9
 <211> 94
 <212> PRT
 <213> M. tuberculosis

<400> 9
 Met Thr Ile Asn Tyr Gln Phe Gly Asp Val Asp Ala His Gly Ala Met
 1
 Ile Arg Ala Gln Ala Gly Leu Leu Glu Ala Glu His Gln Ala Ile Val
 20
 25
 30
 Arg Asp Val 35 Leu Ala Ala Gly Asp Phe Trp Gly Gly Ala Gly Ser Val
 40
 45
 50
 Ala Cys Gln Glu Phe Ile Thr 55 Gln Leu Gly Arg Asn Phe Gln Val Ile
 60
 65
 Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val 75 Gln Ala Ala Gly Asn
 70
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 Asn Met Ala Gln Thr 85 Asp Ser Ala Val 90 Gly Ser Ser Trp Ala
 90

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<210> 10
<211> 285
<212> DNA
<213> M. tuberculosis

<220>
<221> CDS
<222> (1)...(282)

<400> 10
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1                               10
                                15

atc cgc gct cag gcc ggg ttg ctg gag cgc gag cat cag gcc atc gtt      96
Ile Arg Ala Gln Ala Gly Leu Leu Glu Ala Glu His Gln Ala Ile Val
20                               25
                                30

cgt gat gtg ttg gcc gcg ggt gac ttt tgg ggc ggc gcc ggt tcg gtg      144
Arg Asp Val 35 Leu Ala Ala Gly Asp Phe Trp Gly Gly Ala 45 Ser Val
50                               55
                                60

gct tgc cag gag ttg att acc cag ttg ggc cgt aac ttc cag gtg atc      192
Ala Cys Gln Glu Phe Ile Thr 55 Gln Leu Gly Arg Asn Phe Gln Val Ile
50                               55
                                60

tac gag cag gcc aac gcc cac ggg cag aag gtg cag gct gcc ggc aac      240
Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val 75 Gln Ala Ala Gly Asn
65                               70
                                75
                                80

aac atg gca caa acc gac agc gcc gtc ggc tcc agc tgg gcc      282
Asn Met Ala Gln Thr 85 Asp Ser Ala Val Gly Ser Ser Trp Ala
90                               90

tga      285

<210> 11
<211> 94
<212> PRT
<213> M. tuberculosis

<400> 11
Met Thr Ile Asn Tyr Gln Phe Gly Asp Val Asp Ala His Gly Ala Met
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Ile Arg Ala Gln Ala Gly Leu Leu Glu Ala Glu His Gln Ala Ile Val
20                               25                               30
Arg Asp Val 35 Leu Ala Ala Gly Asp Phe Trp Gly Gly Ala Gly Ser Val
50                               55                               60
Ala Cys Gln Glu Phe Ile Thr 55 Gln Leu Gly Arg Asn Phe Gln Val Ile
65                               70                               75
Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val 75 Gln Ala Ala Gly Asn
80                               85                               90
Asn Met Ala Gln Thr 85 Asp Ser Ala Val Gly Ser Ser Trp Ala
90                               90

<210> 12
<211> 327
<212> DNA
<213> M. tuberculosis

<220>
<221> CDS

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2010_11_15_Sequence_Listing

<222> (1)...(327)

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<400> 12
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1 5 10 15

aaa cgg gct gag tcg gga atg ctc ggc ggg ttg tcg gtt ccg ctc agc      96
Lys Arg Ala Glu Ser Gly Met Leu Gly Gly Leu Ser Val Trp Leu Ser
20 25 30

tgg gga gtg gct gtg cca ccc gat gat tat gac cac tgg gcg cct gcg      144
Trp Gly Val Ala Val Pro Pro Asp Asp Tyr Asp His Trp Ala Pro Ala
35 40 45

ccg gag gac ggc gcc gat gtc gat gtc cag gcg gcc gaa ggg gcg gac      192
Pro Glu Asp Gly Ala Asp Val Asp Val Gln Ala Glu Gly Ala Asp
50 55 60

gca gag gcc gcg gcc atg gac gag tgg gat gag tgg cag gcg tgg aac      240
Ala Glu Ala Ala Ala Met Asp Glu Trp Asp Glu Trp Trp Gln Ala Trp Asn
65 70 75 80

gag tgg gtg gcg gag aac gct gaa ccc cgc ttt gag gtg cca cgg agt      288
Glu Trp Val Ala Glu Asn Ala Glu Pro Arg Phe Glu Val Pro Arg Ser
85 90 95

agc agc agc gtg att ccg cat tct ccg gcg gcc ggc tag      327
Ser Ser Ser Val Ile Pro His Ser Pro Ala Ala Gly
100 105

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<210> 13
 <211> 108
 <212> PRT
 <213> M. tuberculosis

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<400> 13
Met Leu Leu Pro Leu Gly Pro Pro Leu Pro Pro Asp Ala Val Val Ala
1 5 10 15
Lys Arg Ala Glu Ser Gly Met Leu Gly Leu Ser Val Pro Leu Ser
20 25 30
Trp Gly Val Ala Val Pro Pro Asp Asp Tyr Asp His Trp Ala Pro Ala
35 40 45
Pro Glu Asp Gly Ala Asp Val Asp Val Gln Ala Ala Glu Gly Ala Asp
50 55 60
Ala Glu Ala Ala Ala Met Asp Glu Trp Asp Glu Trp Gln Ala Trp Asn
65 70 75 80
Glu Trp Val Ala Glu Asn Ala Glu Pro Arg Phe Glu Val Pro Arg Ser
85 90 95
Ser Ser Ser Val Ile Pro His Ser Pro Ala Ala Gly
100 105

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<210> 14
 <211> 324
 <212> DNA
 <213> M. tuberculosis

<220>
 <221> CDS
 <222> (1)...(324)

<400> 14

2010_11_15_Sequence_Listing

ttg acc cac aag cgc act aaa cgc cag cca gcc atc gcc gca ggg ctc	48
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1 5 10 15	
aac gcc ccg cgt cgg aat cgc gtt ggg cgg caa cat ggt tgg ccg gcc	96
Asn Ala Pro Arg Asn Arg Val Gly Arg Gln His Gly Trp Pro Ala	
20 25 30	
gac gtt ccg tcc gcc gag cag cgc cgc gcc caa cgg cag cgc gac ctc	144
Asp Val Pro Ser Ala Glu Gln Arg Ala Gln Arg Gln Arg Asp Leu	
35 40 45	
gag gct atc cgc cga cgc tac gcc gag atg gtg cgc aca tca cac gaa	192
Glu Ala Ile Arg Arg Ala Tyr Ala Glu Met Val Ala Thr Ser His Glu	
50 55 60	
atc gac gac gac aca gcc gaa ctg cgc ctg ttg tgc atg cat ctc gac	240
Ile Asp Asp Asp Thr Ala Glu Leu Ala Leu Leu Ser Met His Leu Asp	
65 70 75 80	
gat gag cag cgc cgg ctt gag cgc ggg atg aag ctc ggc tgg cat ccg	288
Asp Glu Gln Arg Arg Leu Glu Ala Gly Met Lys Leu Gly Trp His Pro	
85 90 95	
tat cac ttc ccc gac gaa ccc gac agc aaa cag tga	324
Tyr His Phe Pro Asp Glu Pro Asp Ser Lys Gln	
100 105	

<210> 15
 <211> 107
 <212> PRT
 <213> M. tuberculosis

<400> 15	
Met Thr His Lys Arg Thr Lys Arg Gln Pro Ala Ile Ala Ala Gly Leu	
1 5 10 15	
Asn Ala Pro Arg Asn Arg Val Gly Arg Gln His Gly Trp Pro Ala	
20 25 30	
Asp Val Pro Ser Ala Glu Gln Arg Arg Ala Gln Arg Gln Arg Asp Leu	
35 40 45	
Glu Ala Ile Arg Arg Ala Tyr Ala Glu Met Val Ala Thr Ser His Glu	
50 55 60	
Ile Asp Asp Asp Thr Ala Glu Leu Ala Leu Leu Ser Met His Leu Asp	
65 70 75 80	
Asp Glu Gln Arg Arg Leu Glu Ala Gly Met Lys Leu Gly Trp His Pro	
85 90 95	
Tyr His Phe Pro Asp Glu Pro Asp Ser Lys Gln	
100 105	

<210> 16
 <211> 246
 <212> DNA
 <213> M. tuberculosis

<220>
 <221> CDS
 <222> (1)...(246)

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atg agc ggc cac gcg ttg gct gct cgg acg ttg ctg gcc gcc gcg gac	48
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1 5 10 15	

2010_11_15_Sequence_Listing

gag ctt gtc ggc ggc ccg cca gtc gag gct tcg gcc gcc cgt gcc	96
Glu Leu Val Gly Gly Pro Pro Val Glu Ala Ser Ala Ala Ala Leu Ala	
20 25 30	
ggc gac gcc gcg ggc gca tgg cgg acc gcg gcc gtc gag ctt gcg cga	144
Gly Asp Ala Ala Gly Ala Trp Arg Thr Ala Ala Val Glu Leu Ala Arg	
35 40 45	
gcg ttg gtc cgc gct gtg gcg gag tcg cac ggc gtc gcg gcc gtt ttg	192
Ala Leu Val Arg Ala Val Ala Glu Ser His Gly Val Ala Ala Val Leu	
50 55 60	
ttc gcc gcg acg gcc gcc gcg gcg gcg gcc gtc gac cgg ggt gat ccg	240
Phe Ala Ala Thr Ala Ala Ala Ala Val Asp Arg Gly Asp Pro	
65 70 75 80	
ccg tga	246
Pro	

<210> 17
 <211> 81
 <212> PRT
 <213> M. tuberculosis

<400> 17	
Met Ser Gly His Ala Leu Ala Ala Arg Thr Leu Leu Ala Ala Ala Asp	
1 5 10 15	
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20 25 30	
Gly Asp Ala Ala Gly Ala Trp Arg Thr Ala Ala Val Glu Leu Ala Arg	
35 40 45	
Ala Leu Val Arg Ala Val Ala Glu Ser His Gly Val Ala Ala Val Leu	
50 55 60	
Phe Ala Ala Thr Ala Ala Ala Ala Ala Val Asp Arg Gly Asp Pro	
65 70 75 80	
Pro	

<210> 18
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 <212> DNA
 <213> M. tuberculosis

<220>
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 <222> (1)...(294)

<400> 18	
atg agt ttg ttg gat gcc cat att ccg cag ttg atc gct tcg cat acg	48
Met Ser Leu Leu Asp Ala His Ile Pro Gln Leu Ile Ala Ser His Thr	
1 5 10 15	
gcg ttt gcc gct aag gcg ggg ttg atg cgg cat acg atc ggt cag gcc	96
Ala Phe Ala Ala Lys Ala Gly Leu Met Arg His Thr Ile Gly Gln Ala	
20 25 30	
gag cag cag gcg atg tcg gcg cag gcg ttt cat cag gga gag tcc gcg	144
Glu Gln Gln Ala Met Ser Ala Gln Ala Phe His Gln Gly Glu Ser Ala	
35 40 45	

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gcg	gcg	ttt	cag	ggt	gcg	cat	gcc	cgg	ttt	gtg	gcc	gcg	gcc	gcc	aag	192
Ala	Ala	Phe	Gln	Gly	Ala	His	Ala	Arg	Phe	Val	Ala	Ala	Ala	Ala	Lys	
	50					55					60					
gtc	aat	acc	ttg	ctg	gat	atc	gcg	caa	gcc	aat	ttg	ggt	gag	gcc	gcg	240
Val	Asn	Thr	Leu	Leu	Asp	Ile	Ala	Gln	Ala	Asn	Leu	Gly	Glu	Ala	Ala	
	65				70					75					80	
ggc	acg	tat	gtg	gcc	gcc	gat	gcc	gcc	gcc	gcg	tcc	agc	tac	acc	ggg	288
Gly	Thr	Tyr	Val	Ala	Ala	Asp	Ala	Ala	Ala	Ala	Ser	Ser	Tyr	Thr	Gly	
				85					90					95		
ttt	tta															294
Phe	Leu															

<210> 19
 <211> 97
 <212> PRT
 <213> M. tuberculosis

<400> 19
 Met Ser Leu Leu Asp Ala His Ile Pro Gln Leu Ile Ala Ser His Thr
 1 5 10 15
 Ala Phe Ala Ala Lys Ala Gly Leu Met Arg His Thr Ile Gly Gln Ala
 20 25 30
 Glu Gln Gln Ala Met Ser Ala Gln Ala Phe His Gln Gly Glu Ser Ala
 35 40 45
 Ala Ala Phe Gln Gly Ala His Ala Arg Phe Val Ala Ala Ala Ala Lys
 50 55 60
 Val Asn Thr Leu Leu Asp Ile Ala Gln Ala Asn Leu Gly Glu Ala Ala
 65 70 75 80
 Gly Thr Tyr Val Ala Asp Ala Ala Ala Ser Ser Tyr Thr Gly
 85 90 95
 Phe

<210> 20
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 <212> DNA
 <213> M. tuberculosis

<220>
 <221> CDS
 <222> (1)...(303)

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Met	Asn	Ala	Asp	Pro	Val	Leu	Ser	Tyr	Asn	Phe	Asp	Ala	Ile	Glu	Tyr	
	1			5					10					15		
tcc	gtt	cgt	cag	gag	atc	cac	acc	acc	gcg	gcc	cgt	ttc	aac	gct	gcg	96
Ser	Val	Arg	Gln	Glu	Ile	His	Thr	Thr	Ala	Ala	Arg	Phe	Asn	Ala	Ala	
			20					25					30			
ctg	caa	gag	ctg	agg	tcg	cag	atc	gcg	ccg	ttg	cag	cag	ctc	tgg	aca	144
Leu	Gln	Glu	Leu	Arg	Ser	Gln	Ile	Ala	Pro	Leu	Gln	Gln	Leu	Trp	Thr	
		35					40					45				
cgg	gaa	gcg	gcc	gcc	gcc	tac	cac	gcg	gag	caa	ctc	aag	tgg	cac	cag	192
Arg	Glu	Ala	Ala	Ala	Ala	Tyr	His	Ala	Glu	Gln	Leu	Lys	Trp	His	Gln	
	50					55					60					

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gcg gcc agc gcg ctc aac gag atc ctg atc gac ttg gga aac gcg gtt 240
Ala Ala Ser Gln Leu Asn Glu Ile Leu Ile Asp Leu Gly Asn Ala Val 80
65 70 75

cgc cac ggt gcc gac gag gtg gcg cat gcc gac cgg cgg gcg gct gga 288
Arg His Gly Ala Asp Asn Val Ala His Ala Asp Arg Arg Ala Ala Gly 90 95

gct tgg gca cgc tag 303
Ala Trp Ala Arg 100

<210> 21
<211> 100
<212> PRT
<213> M. tuberculosis

<400> 21
Met Asn Ala Asp Pro Val Leu Ser Tyr Asn Phe Asp Ala Ile Glu Tyr
1 5 10 15
Ser Val Arg Gln Glu Ile His Thr Thr Ala Ala Arg Phe Asn Ala Ala
20 25 30
Leu Gln Glu Leu Arg Ser Gln Ile Ala Pro Leu Gln Gln Leu Trp Thr
35 40 45
Arg Glu Ala Ala Ala Tyr His Ala Glu Gln Leu Lys Trp His Gln
50 55 60
Ala Ala Ser Ala Leu Asn Glu Ile Leu Ile Asp Leu Gly Asn Ala Val
65 70 75 80
Arg His Gly Ala Asp Asn Val Ala His Ala Asp Arg Arg Ala Gly
85 90 95
Ala Trp Ala Arg 100

<210> 22
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<212> DNA
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<220>
<221> CDS
<222> (1)...(378)

<400> 22 48
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Leu Val Glu Pro Gly Arg Ile Gly Gly Asn Gln Thr Arg Leu Ala Ala
1 5 10 15

gtc cta ctt gat gtg agc aca ccg aac acg ctg aac gcc gac ttt gac 96
Val Leu Leu Asp Val Ser Thr Pro Asn Thr Leu Asn Ala Asp Phe Asp
20 25 30

ctg atg cgt tcg gtt gcg ggt atc acg gac gcc cgc aat gag gaa atc 144
Leu Met Arg Ser Val Ala Gly Ile Thr Asp Ala Arg Asn Glu Glu Ile
35 40 45

cgt gcg atg ctg cag gca ttc atc ggc cgc atg agc ggt gtg ccg ccg 192
Arg Ala Met Leu Gln Ala Phe Ile Gly Arg Met Ser 60

tcg gtg tgg ggt ggg ctc gcg gcc gct cgg ttc cag gat gtg gtg gat 240
Ser Val Trp Gly Gly Leu Ala Ala Ala Arg Phe Gln Asp Val Val Asp
100 105 110 115 120

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65	70	75	80	
cgc tgg aac gcc gag tcg acg cgg ctc tac cac gtc ctg cac gcg atc	Arg Trp Asn Ala Glu 85	Ser Thr Arg Leu Tyr 90	His Val Leu His Ala 95	288
gcc gac acc atc cgc cac aac gag gcc gcg ctg cgg gaa gcc ggc caa	Ala Asp Thr Ile 100	Arg His Asn Glu 105	Ala Leu Arg Glu 110	336
atc cat gcc cgc cac atc gcc gcc gcc ggc ggc gac cta tag	Ile His Ala 115	Arg His Ile Ala 120	Ala Leu 125	378
<210> 23				
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<400> 23				
Met Val Glu Pro Gly Arg Ile Gly Gly Asn Gln Thr Arg Leu Ala Ala	1 5	20 25	30 35	40 45
Val Leu Leu Asp Val Ser Thr Pro Asn Thr Leu Asn Ala Asp Phe Asp	50 55	60 65	70 75	80 85
Leu Met Arg Ser Val Ala Gly Ile Thr Asp Ala Arg Asn Glu Glu Ile	90 95	100 105	110 115	120 125
Arg Ala Met Leu Gln Ala Phe Ile Gly Arg Met Ser Gly Val Pro Pro	130 135	140 145	150 155	160 165
Ser Val Trp Gly Gly Leu Ala Ala Ala Arg Phe Gln Asp Val Val Asp	170 175	180 185	190 195	200 205
Arg Trp Asn Ala Glu Ser Thr Arg Leu Tyr His Val Leu His Ala Ile	210 215	220 225	230 235	240 245
Ala Asp Thr Ile Arg His Asn Glu Ala Ala Leu Arg Glu Ala Gly Gln	250 255	260 265	270 275	280 285
Ile His Ala Arg His Ile Ala Ala Gly Gly Asp Leu	290 295	300 305	310 315	320 325
<210> 24				
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<212> DNA				
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<220>				
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<222> (1)...(288)				
<400> 24				
atg tca gat caa atc acg tat aac ccg gga gcc gta tcc gac ttc gct	Met Ser Asp Gln Ile 5	Thr Tyr Asn Pro Gly 10	Ala Val Ser Asp Phe 15	48
tcc gac gtg ggc tcg cgc gcc ggc cag ctc cac atg att tac gaa gac	Ser Asp Val Gly 20	Ser Arg Ala Gly 25	Leu His Met Ile Tyr 30	96
acc gcc agc aaa aca aat gcg ctg caa gag ttt ttc gcg ggc cac ggc	Thr Ala Ser 35	Lys Thr Asn Ala Leu 40	Gln Glu Phe Phe 45	144
gcg caa ggg ttt ttc gac gcc cag gcg cag atg ctg tcg ggg ctg cag	Ala Gln Gly Phe Phe Asp Ala 55	Gln Ala Gln Met Leu 60	Ser Gly Leu Gln	192

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ggg ctc att gag acg gtg ggt cag cat ggg act acc acc ggc cac gtg 240
Gly Leu Ile Glu Thr Val Gly Gln His Gly Thr Thr Thr Gly His Val
65 70 75 80

ctg gac aac gcg atc gga acc gac cag gcc atc gcg ggc ttg ttc taa 288
Leu Asp Asn Ala Ile Gly Thr Asp Gln Ala Ile Ala Gly Leu Phe
85 90 95

<210> 25
<211> 95
<212> PRT
<213> M. tuberculosis

<400> 25
Met Ser Asp Gln Ile Thr Tyr Asn Pro Gly Ala Val Ser Asp Phe Ala
1 5 10 15
Ser Asp Val Gly Ser Arg Ala Gly Gln Leu His Met Ile Tyr Glu Asp
20 25 30
Thr Ala Ser Lys Thr Asn Ala Leu Gln Glu Phe Phe Ala Gly His Gly
35 40 45
Ala Gln Gly Phe Phe Asp Ala Gln Ala Gln Met Leu Ser Gly Leu Gln
50 55 60
Gly Leu Ile Glu Thr Val Gly Gln His Gly Thr Thr Gly His Val
65 70 75 80
Leu Asp Asn Ala Ile Gly Thr Asp Gln Ala Ile Ala Gly Leu Phe
85 90 95

<210> 26
<211> 324
<212> DNA
<213> M. tuberculosis

<220>
<221> CDS
<222> (1)...(324)

<400> 26
gtg gca gac aca att cag gta aca ccg cag atg ctg cgc agc acc gcc 48
Val Ala Asp Thr Ile Gln Val Thr Pro Gln Met Leu Arg Ser Thr Ala
1 5 10 15

aac gat atc cag gcg aat atg gag caa gcc atg gga atc gcc aag gcc 96
Asn Asp Ile Gln Ala Asn Met Glu Gln Ala Met Gly Ile Ala Lys Gly
20 25 30

tac cta gcc aac cag gaa aac gtc atg aac ccc gcc acc tgg tct ggt 144
Tyr Leu Ala Asn Gln Glu Asn Val Met Asn Pro Ala Thr Trp Ser Gly
35 40 45

acc ggc gtc gtt gct tcg cat atg aca gcc acc gag atc acc aat gaa 192
Thr Gly Val Val Ala Ser His Met Thr Ala Thr Glu Ile Thr Asn Glu
50 55 60

ttg aac aag gtc ctt acc ggg ggc acg cgc ctg gcc gag ggc ctc gtg 240
Leu Asn Lys Val Leu Thr Gly Gly Thr Arg Leu Ala Glu Gly Leu Val
65 70 75 80

cag gcc gca gcc ctg atg gag gga cac gag gcg gac tcg cag aca gcg 288
Gln Ala Ala Ala Leu Met Glu Gly His Glu Ala Asp Ser Gln Thr Ala
85 90 95

2010_11_15_Sequence_Listing

ttt cag gcg ctg ttc ggc gct agc cac gga tcc tga 324
 Phe Gln Ala Leu Phe Gly Ala Ser His Gly Ser
 100 105

<210> 27
 <211> 107
 <212> PRT
 <213> M. tuberculosis

<400> 27
 Met Ala Asp Thr Ile Gln Val Thr Pro Gln Met Leu Arg Ser Thr Ala
 1 5 10 15
 Asn Asp Ile Gln Ala Asn Met Glu Gln Ala Met Gly Ile Ala Lys Gly
 20 25 30
 Tyr Leu Ala Asn Gln Glu Asn Val Met Asn Pro Ala Thr Trp Ser Gly
 35 40 45
 Thr Gly Val Val Ala Ser His Met Thr Ala Thr Glu Ile Thr Asn Glu
 50 55 60
 Leu Asn Lys Val Leu Thr Gly Gly Thr Arg Leu Ala Glu Gly Leu Val
 65 70 75 80
 Gln Ala Ala Ala Leu Met Glu Gly His Glu Ala Asp Ser Gln Thr Ala
 85 90 95
 Phe Gln Ala Leu Phe Gly Ala Ser His Gly Ser
 100 105

<210> 28
 <211> 273
 <212> DNA
 <213> M. tuberculosis

<220>
 <221> CDS
 <222> (1)...(273)

<400> 28 48
 gtg gat ccg acc gtg ttg gct gat gcg gtg gcg cgg atg gcc gaa ttc
 Val Asp Pro Thr Val Leu Ala Asp Ala Val Ala Arg Met Ala Glu Phe
 1 5 10 15
 ggt cgc cac gtc gag gag ctg gtc gcc gag att gag tcc ttg gtt acc
 Gly Arg His Val Glu Glu Leu Val Ala Glu Ile Glu Ser Leu Val Thr
 20 25 30 96
 cgg ctg cat gtg acg tgg acg ggg gag ggc gcg cgc gct cat gct gag
 Arg Leu His Val Thr Trp Thr Gly Glu Gly Ala Ala Ala His Ala Glu
 35 40 45 144
 gcg caa cga cat tgg gct gcc ggt gag gcg atg atg cgc cag gcg ttg
 Ala Gln Arg His Trp Ala Ala Gly Glu Ala Met Met Arg Gln Ala Leu
 50 55 60 192
 gcc cag ctc acg gcc gcg ggg cag agc gcg cac gcc aac tac acc ggc
 Ala Gln Leu Thr Ala Glu Gly Gln Ser Ala His Ala Asn Tyr Thr Gly
 65 70 75 80 240
 gcg atg gcc acg aat ttg ggt atg tgg tcg tga 273
 Ala Met Ala Thr Asn Leu Gly Met Trp Ser
 85 90

<210> 29
 <211> 90

2010_11_15_Sequence_Listing

<212> PRT

<213> M. tuberculosis

<400> 29

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Met Asp Pro Thr Val Leu Ala Asp Ala Val Ala Arg Met Ala Glu Phe
 1      5      10      15
Gly Arg His Val Glu Leu Val Ala Ile Glu Ser Leu Val Thr
 20      25      30
Arg Leu His Val Thr Trp Thr Gly Glu Ala Ala His Ala Glu
 35      40      45
Ala Gln Arg His Trp Ala Ala Gly Glu Ala Met Met Arg Gln Ala Leu
 50      55      60
Ala Gln Leu Thr Ala Ala Gly Gln Ser Ala His Asn Tyr Thr Gly
 65      70      75      80
Ala Met Ala Thr Asn Leu Gly Met Trp Ser
 85      90
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<210> 30

<211> 312

<212> DNA

<213> M. tuberculosis

<220>

<221> CDS

<222> (1)...(312)

<400> 30

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atg ggt gcc gac gac acg ctg cgc gta gag cct gcg gtg atg cag ggt      48
Met Gly Ala Asp Asp Thr Leu Arg Val Glu Pro Ala Val Met Gln Gly
 1      5      10
ttc gcc gcg tcg ttg gat gga cgc gcc gag cat ctc gcg gtt caa ctg      96
Phe Ala Ala Ser Leu Asp Gly Ala Ala Glu His Leu Ala Val Gln Leu
 20      25      30
gcc gag ctg gac gct cag gtc ggg cag atg ttg ggc ggg tgg cgc ggg      144
Ala Glu Leu Asp Ala Gln Val Gly Gln Met Leu Gly Gly Trp Arg Gly
 35      40      45
gcg tcg ggc agt gcg tat ggc tcg cgc tgg gag cta tgg cat cgc ggg      192
Ala Ser Gly Ser Ala Tyr Gly Ser Ala Trp Glu Leu Trp His Arg Gly
 50      55      60
gcc ggt gag gtg cag ctg gga ttg tcg atg ctg gcg gcg gcg ata gct      240
Ala Gly Glu Val Gln Leu Gly Leu Ser Met Leu Ala Ala Ala Ile Ala
 65      70      75      80
cac gcc ggt gcg ggt tat caa cac aac gag acc gcg tcg gcg cag gtg      288
His Ala Gly Ala Gly Tyr Gln His Asn Glu Thr Ala Ser Ala Gln Val
 85      90      95
ctt cgt gag gtg ggc ggt ggc tga      312
Leu Arg Glu Val Gly Gly
100
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<210> 31

<211> 103

<212> PRT

<213> M. tuberculosis

<400> 31

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Met Gly Ala Asp Asp Thr Leu Arg Val Glu Pro Ala Val Met Gln Gly
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2010_11_15_Sequence_Listing

1	5	10	15
Phe Ala Ala Ser	Leu Asp Gly Ala Ala Glu	His Leu Ala Val	Gln Leu
20	25	30	
Ala Glu Leu Asp	Ala Gln Val Gly Gln Met	Leu Gly Gly Trp	Arg Gly
35	40	45	
Ala Ser Gly Ser	Ala Tyr Gly Ser	Ala Trp Glu Leu	Trp His Arg Gly
50	55	60	
Ala Gly Glu Val	Gln Leu Gly Leu Ser	Met Leu Ala Ala	Ile Ala
65	70	75	80
His Ala Gly Ala	Gly Tyr Gln His Asn	Glu Thr Ala Ser	Ala Gln Val
85	90	95	
Leu Arg Glu Val	Gly Gly Gly		
100			

<210> 32
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic cloning primer

<400> 32
 ctgagatcta tgagcctttt ggatgc 26

<210> 33
 <211> 31
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic cloning primer

<400> 33
 ctaagcttgg atcctcagaa cccggtatag g 31

<210> 34
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic cloning primer

<400> 34
 ctgagatctt tgatccccgg tcggatgggt 30

<210> 35
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic cloning primer

<400> 35
 ctcccatggg tcaggtgatc gaatcagcca 30

<210> 36
 <211> 25
 <212> DNA
 <213> Artificial Sequence

2010_11_15_Sequence_Listing

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<220>
<223> Synthetic cloning primer

<400> 36
ctgagatcta tgaccatcaa ctatc
25

<210> 37
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 37
ctaagcttgg atccttaggc ccagctggag cc
32

<210> 38
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 38
ctgagatcta tgaccatcaa ctatc
25

<210> 39
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 39
ctaagcttgg atcctcaggc ccagctggag cc
32

<210> 40
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 40
ctgagatctg tgcttttgcc tcttggtccg
30

<210> 41
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 41
cccaagcttc tagccggccg ccggaga
27

<210> 42
<211> 30

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2010_11_15_Sequence_Listing

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<212> DNA
<213> Artificial Sequence

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<223> Synthetic cloning primer

<400> 42
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<210> 43
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 43
ctcccatggt cactgtttcg ctgtcgggtt c       31

<210> 44
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 44
ctgagatcta tgagcggcc cgcgttggt          30

<210> 45
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 45
ctcccatggt cacggcggat caccgcggtc        30

<210> 46
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 46
ctgagatcta tgagtttgtt ggatgcccat        30

<210> 47
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic cloning primer

<400> 47
ctcccatggt taaaaccggg tgtagctgga        30

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2010_11_15_Sequence_Listing

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<210> 48
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 48
ctgagatcta tgaacgcaga ccccgtag          27

<210> 49
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 49
ctaagcttgg atccctagcg tgcccaagct cc          32

<210> 50
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 50
ctgagatcta tggttgaacc gggaagg          27

<210> 51
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 51
ctaagcttgg atccctatag gtcgccgcgc gc          32

<210> 52
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

<400> 52
ctgagatcta tgcagatca aatcacg          27

<210> 53
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic cloning primer

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2010_11_15_Sequence_Listing

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<400> 54 ctgagatcta tggcagacac aattcagg	28
<210> 55 <211> 32 <212> DNA <213> Artificial Sequence	
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<400> 55 ctaagcttcc cgggtcagga tccgtggcta gc	32
<210> 56 <211> 28 <212> DNA <213> Artificial Sequence	
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<400> 56 ctgagatcta tggatccgac cgtgttgg	28
<210> 57 <211> 25 <212> DNA <213> Artificial Sequence	
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<400> 57 ctgccatggc cagcaccaca taccc	25
<210> 58 <211> 26 <212> DNA <213> Artificial Sequence	
<220> <223> Synthetic cloning primer	
<400> 58 ctgagatcta tgggtgccga cgacac	26
<210> 59 <211> 30 <212> DNA <213> Artificial Sequence	

2010_11_15_Sequence_Listing

<220>

<223> Synthetic cloning primer

<400> 59

ctaagcttgg atcctcagcc accgcccacc

30